JAPAN

EDICT OF GOVERNMENT

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JIS B 9709-2 (2001) (English): Safety of machinery -- Reduction of risks to health from hazardous substances emitted by machinery -- Part 2: Methodology leading to verification procedures

ISO INSIDE

安 全

The citizens of a nation must honor the laws of the land.

Fukuzawa Yukichi

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JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 9709-2 : 2001

(ISO 14123-2 : 1998)

Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures

ICS 13.110 ; 13.300

Descriptors : equipment safety, occupational safety, toxic materials, safety education

Reference number : JIS B 9709-2 : 2001 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

Date of Establishment: 2001-09-20

Date of Public Notice in Official Gazette: 2001-09-20

Investigated by: Japanese Industrial Standards Committee

Standard Board

Technical Committee on Industrial Machine

JIS B 9709-2 :2001, First English edition published in 2004-11

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

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JAPANESE INDUSTRIAL STANDARD

JIS B 9709-2 : 2001
(ISO 14123-2 : 1998)

Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 14123-2** *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures* published in 1998 without modifying the technical contents.

The foreword of the original International Standard has been excluded because it is not part of the provisions.

1 Scope This part of **JIS B 9709** defines a procedure which leads to the selection of critical factors relating to emissions of hazardous substances for the purpose of specifying suitable verification procedures.

This part of **JIS B 9709** is intended to be used in conjunction with **JIS B 9709-1**:2001.

NOTE : The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 14123-2 : 1998 *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 2: Methodology leading to verification procedures* (IDT)

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. If the indication of the year of coming into effect or the year of publication is given to these referred standards, only the edition of the indicated year constitutes the provision of this Standard but the revision and amendment made thereafter do not apply. The normative references without the indication of the year of coming into effect or the year of publication apply only to the most recent edition (including amendments).

JIS B 9709-1 : 2001 *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers*

NOTE : **ISO 14123-1**:1998 *Safety of machinery — Reduction of risks to health from hazardous substances emitted by machinery — Part 1: Principles and specifications for machinery manufacturers* is identical with the said standard.

ISO/DIS 12100-1 *Safety of machinery — Basic concepts and general principles for design — Part 1: Basic terminology, methodology*

3 Methodology This clause defines the steps that shall be taken to lead to a verification procedure.

NOTE : These steps are summarized in annex **A**.

3.1 Identification of hazardous substances

3.1.1 Identify substances which may be emitted during the intended use of the machine (see **ISO/DIS 12100-1** and **JIS B 9709-1**:2001 clause **4**).

3.1.2 Determine which of these substances are hazardous to health and the nature of the hazard (see **JIS B 9709-1**:2001 **3.2**).

3.1.3 Where a number of substances has been identified, the verification procedure should be carried out on key substances which represent worst-case properties. Key substances may be selected based on toxicity, corrosive properties, solvent properties, dustiness, etc.

3.2 Characterization of emissions For all significant emissions of substances identified by **3.1.3**, establish:

- the likely quantity or scale of emissions under all foreseeable circumstances at all stages in the life of the machine;

  NOTE 1 Amounts may be characterized by one of a number of assessment techniques (see annex **B**).

- the location and direction of the emission with respect to the machine and the likely position of persons;
- when the emission is likely to occur;

  NOTE 2 This should relate to the likely presence of persons and the operating cycle of the machinery.

- the physical characteristics of the emission, e.g. phase, velocity, temperature, pressure;
- whether it is likely to create an airborne emission or surface contamination.

3.3 Identification of critical factors

3.3.1 Identify any relevant factor which causes an emission and on which the method of emission reduction is based.

NOTE : Relevant factors may be related to materials, energy or machine design or performance; examples are given in annex **C**.

3.3.2 Identify critical factors. These are the relevant factors on which the emission is most dependent.

3.4 Specification of indicative parameters

3.4.1 Establish indicative parameters, which may be qualitative, related directly to the critical factors identified.

NOTE : Examples are given in annex C.

3.4.2 Specify the value, range of values, condition of state of the indicative parameter required to reduce emission.

4 Verification

4.1 Verification is carried out by collection of data relating to the indicative parameters.

4.2 Verification may include results from field testing, laboratory testing, measurements, examination or calculations.

Annex A (normative) Flow diagram of steps leading to verification procedure

Table A.1 gives the sequence of steps to be taken in a verification procedure.

Table A.1

Clause	Sequence of steps	Examples
3.1	Identify hazardous substances ⇓	– identify stage in life of the machine; – identify the hazardous properties.
3.2	Characterize emissions ⇓	– likely quantity or scale of emission; – location of persons and direction of emissions; – when the emission is likely to occur; – physical characteristics; phase (e.g. gas), temperature; – airborne or surface contamination.
3.3.1	Identify relevant factors ⇓	– materials: dustiness; usage rates, production rates; – energy used: type; – machine design: ergonomics; distances; automation; – performance: efficacy.
3.3.2	Select critical factors ⇓	factors which most influence the emission of hazardous substances; prioritize these to assist selection of indicative parameters.
3.4.1	Specify indicative parameters ⇓	– quantitative: obtained by measurements or calculations; – qualitative: information obtained by e.g. visual inspection; visualization techniques, design details.
3.4.2	Set parameter values, ranges, conditions or states ⇓	requirements to give performance which reduces emissions.
4	Specify verification procedures ⇓	– specify information which relates to the specified indicative parameters; – evidence from field/laboratory tests, measurements, visual inspections or calculations, technical construction file.

Annex B (normative) Examples of types of emission and how to assess them

Table B.1 gives examples of types of emission and their assessment.

Table B.1

Type of emission	Examples of assessment techniques
Nil or insignificant	– visual inspection; – smoke tests; – Tyndall beam lamp; – pressure testing.
Localized	– component performance; – local concentration assessment.
Total (possibly multipoint emissions)	– calculation from mass balance; – test data.

Annex C (informative) Examples of relevant factors and their indicative parameters

Table C.1 gives examples of factors which may affect the reduction of risks to health from hazardous substances emitted by machinery.

Table C.1

Category	Relevant factors	Indicative parameters
Materials	Feed rates, discharge rates	mass rate (kg/h) linear rate (mm/min) resultant airborne concentrations (mg/m^3)
	Feed forms	dusty or solid, viscous, non-viscous or volatile liquids
	Process timing	feed times (min)
Energy	Thermal	temperature control (range °C) rate of temperature rise or fall (°C/min) product discharge temperature (°C) liquid or gas coolant temperature (°C) coolant flow rate (*l*/h)
	Electrical	energy absorbed (J) drive motor current (A)
	Mechanical	stirring rate (min^{-1}) conveyor speed (m/min) mixing time (min)
	Air motion	cooling or capture velocity (m/s) exhaust gas velocity (m/s) or flowrate (m^3/s)
Design	Settings, geometry, orientation	lid open or closed time delay until lid opens (s) local exhaust ventilation, position exhaust-duct diameter (mm) nearest operator position (m) height of material drop (m) direction of discharge.
Performance	Seal leaks	seal integrity
	Air cleaner	separation efficiency (%) pressure loss across filter (Pa)
	Local exhaust ventilation	capture efficiency (%)
	Pollution control system	decontamination index
	Total emission	emission rate (g/min) pollutant concentration parameter (mg/m^3)

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

Errata will be provided upon request, please contact:

Standardization Promotion Department, Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN
TEL. 03-3583-8002 FAX. 03-3583-0462